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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,859	07/03/2003	Lawrence B. Wolff	Wolff	3840

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EXAMINER	
PATEL, SHEFALI D	
ART UNIT	PAPER NUMBER
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/611,859	WOLFF ET AL.	
	Examiner	Art Unit	
	Shefali D. Patel	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 7/3/03.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 24 August 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 8/11/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on August 11, 2004 has been considered by the examiner.

Drawings

2. The drawings were received on August 24, 2004. These drawings are accepted.

Claim Objections

3. Claims 1, 6, 9, 10, 13, 15 are objected to because of the following informalities:

a. In claim 1 it is recited in the last limitation lines 8-9, "...obtained from the reflective domain and the thermal infrared domain." It is not clear if the thermal infrared domain is the one after the non-uniformity correction (NUC) applied or the original domain (before NUC)?

b. Claim 6 seems to have a punctuation error in the last line of the claim. It is unclear whether what is being assigned and what it is assigned to.

c. The limitation in claim 9 is recited in claim 1. The examiner is not sure why this claim is repetitive and depends on claim 1 when the limitation does not need to be "further included." Perhaps the applicant meant to have claim 9 depend from a claim other than claim 1.

d. Claim 10 recites "capable of" in line 7. The phrase is considered intended use; the computer system could be capable of doing the function or could not be. It is not clear and may not be given any weight.

e. Claim 13 line 1 recites "...computer includes software able to compare..." This also might have punctuation error. Perhaps it should be "...computer includes software **which is** able to compare..." Also, "wherein said has computer includes" does not make sense at all. Please rewrite this in better form so that it is clear and so that the claim language flows.

f. Claim 15 recites LWIR but does not recite the full form of it. The examiner knows that LWIR stands for "Long Wave Infrared". However, these terms need to be defined in claim language just as NUC is being defined in claim 1, for example.

4. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 14 and 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 14 recites the limitation "reflective **domain**" and "infrared **domain**". There is insufficient antecedent basis for this limitation in the claim.

8. Claim 15 recites the limitation "the sub-spectrum". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prokoski (US 6,173,068) in view of Prager et al. (US 5,471,240) (hereinafter, "Prager").

With regard to **claim 1** Prokoski discloses a method for performing face recognition, comprising: producing a first video image input produced from a scene sensed in the reflective domain (medical image

device 122 in Figure 11, col. 20 lines 1-3); producing a second video image input from said scene sensed in the thermal infrared domain (Thermal Imaging device 102 in Figure 11, col. 19 line 39); creating a representation template form a face from a fused combination of the video images obtained from the reflective domain and the thermal infrared domain (overlaid image IO in Figure 11, col. 19 lines 40-50 where the two images are overlaid and hence combined). Prokoski does not expressly disclose applying non-uniformity correction (NUC) to the thermal infrared video image. Prager discloses NUC at method 40 in Figure 3, at col. 2 lines 54-66 and col. 4 lines 21 to 65. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Prager with Prokoski. The motivation for doing so is to correct for the noise in an image (one way that nonuniformities are described) and to eliminate image defects in an imaging sensor or video system, such as a scanning infrared sensor as suggested by Prager at col. 1 lines 59-64. Therefore, it would have been obvious to combine Prager with Prokoski to obtain the invention as specified in claim 1.

With regard to **claim 2** Prokoski discloses utilizing said face representation template for comparison and matching for face recognition system applications including access control (col. 9 lines 43-48 and col. 10 line 44), rank ordered identification (col. 18 lines 51-60) and verification (col. 18 lines 50-51, col. 20 lines 51-54 for automated teller machine col. 15 lines 9-12).

With regard to **claim 3** Prokoski discloses the face representation template is a single or combination of templates of fused reflective domain and thermal infrared domain imagery (the overlay of the images seen in Figure 11 and its respective portions in the specification as described in claim 1).

With regard to **claim 4** Prokoski discloses automatically detecting faces in a scene to extract image regions in the reflective domain and thermal infrared domain from which to initiate creation of a face representation template (col. 19 lines 58-62 and col. 20 lines 36-37).

With regard to **claim 5** Prokoski discloses geometrically normalizing face image regions in the reflective domain and thermal infrared domain (col. 18 lines 18-33).

With regard to **claim 6** Prokoski discloses assigning a set of sub-windows for geometrically normalized face image regions in the reflective domain and the thermal infrared domain (assigning sub-windows as classification depending on the geometric values at col. 17 line 53 to col. 18 lines 1-33 and also illustrated in Figures 4 and 6).

With regard to **claim 7** Prokoski discloses forming face representation templates from each sub-window (forming an image, col. 17 line 63 to col. 18 lines 1-4).

With regard to **claim 8** Prokoski discloses combining face representation templates form each sub-window (as illustrated in Figures 4-6 and described at col. 17 and 18, the templates are combined to form a face representation).

With regard to **claim 9** Prokoski discloses including applying non-uniformity correction to the thermal infrared video image as discussed above in claim 1.

With regard to **claim 10** Prokoski discloses an apparatus consisting of: at least one sensor configuration for simultaneously acquiring a reflective spectrum image an d a thermal infrared spectrum image and producing corresponding reflective spectrum and thermal infrared image signals (sensors 102 and 122 in figure 11); and an interface card connected to said at least one sensor configuration to receive said reflective spectrum and thermal infrared spectrum signals (image processing unit 108 and 118 in Figure 11 and also broadly illustrated in Figure 1 at element 110) and to send said signals to a memory within a computer system (computer 112 in Figure 1 col. 9 lines 20-22; element 114 in Figure 11) and wherein said computer system is ***capable of*** processing said input reflective spectrum and thermal infrared signals to create and store a face representation template (the computer system is assumed to be capable of processing the signals since it is shown by Prokoski and described here within).

With regard to **claim 11** Prokoski discloses computer includes software using said input reflective spectrum/thermal infrared spectrum signals to produce face representation templates (produce an image from the templates as seen in Figures 4 and 6 and formed at col. 17 line 63 to col. 18 lines 1-4).

With regard to **claim 12** Prokoski discloses computer includes software using input reflective spectrum/thermal infrared spectrum imagery to detect faces in a scene (col. 9 lines 23-27).

With regard to **claim 13** Prokoski discloses computer includes software able to compare and match face representation templates of unknown individuals, with those of known individuals (col. 9 lines 34-42).

With regard to **claim 14** Prokoski discloses reflective domain image and thermal infrared domain image are spatially co-registered (col. 19 lines 54-62, col. 21 lines 38-59 and col. 26 lines 58-66).

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prokoski (US 6,173,068) in view of Prager et al. (US 5,471,240) (hereinafter, "Prager") as applied to claims 1-14 above, and further in view of Waxman et al. (US 5,555,324) (hereinafter, "Waxman").

With regard to **claim 15** Prokoski (modified by Prager) discloses the apparatus of claim 14 and reflective domain is the visible spectrum and the sub-spectrum as disclosed above and the arguments are not repeated herein, but are incorporated by reference. Neither Prokoski nor Prager expressly disclose the thermal domain is the LWIR spectrum. Waxman discloses LWIR at 112 in Figure 1 and col. 6 lines 47-48, col. 10 lines 44-46. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Waxman with Prokoski and Prager. The motivation for doing so is to distinguish between the two different objects (whether it be a foreground/background or the road from the forest canopy as suggested by Waxman at col. 1 lines 31-51). Therefore, it would have been obvious to combine Waxman with Prokoski and Prager to obtain the invention as specified in claim 15.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,781,127 – A sensor fusion system simultaneously acquiring images for the visible and the infrared spectral regions

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shefali D. Patel whose telephone number is 571-272-7396. The examiner can normally be reached on M-F 8:00am - 5:00pm (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shefali D Patel
Examiner
Art Unit 2624

sdp